

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/016481

A. CLASSIFICATION OF SUBJECT MATTER

H01L21/337(2006.01), H01L29/808(2006.01), H01L29/80(2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01L21/337(2006.01), H01L29/808(2006.01), H01L29/80(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2005
Kokai Jitsuyo Shinan Koho	1971-2005	Toroku Jitsuyo Shinan Koho	1994-2005

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2000/014809 A1 (Hitachi, Ltd.), 16 March, 2000 (16.03.00), Page 9, line 27 to page 11, line 4; Fig. 5 & EP 1115159 A1 & CN 1292932 A & KR 1023215 A & US 2005/0006649 A1	1, 7, 8
X Y	JP 54-057969 A (Sony Corp.), 10 May, 1979 (10.05.79), Page 3, lower left column, line 8 to lower right column, line 1; page 4, left column, line 12 to right column, line 1; Fig. 11 (Family: none)	1, 9 7

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier application or patent but published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
24 November, 2005 (24.11.05)

Date of mailing of the international search report
06 December, 2005 (06.12.05)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2003-151995 A (Sumitomo Electric Industries, Ltd.), 23 May, 2003 (23.05.03), Par. Nos. [0005], [0022] (Family: none)	7

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The matter common to claims 1-9 is a constitution, "a junction field-effect transistor comprising a semiconductor layer of a first conductivity type having a channel region, a buffer layer formed on the channel region, and an impurity region of a second conductivity type formed on the buffer layer, wherein the concentration of the carriers of the first conductivity type of the buffer layer is lower than that of the first conductivity type of the semiconductor of the first conductivity type".

However, the international search has revealed that the constitution, "a junction field-effect transistor comprising a semiconductor layer of a first conductivity type having a channel region, (continued to extra sheet.)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1, 7-9

Remark on Protest
the

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, payment of a protest fee..
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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Continuation of Box No. III of continuation of first sheet (2)

a buffer layer formed on the channel region, and an impurity region of a second conductivity type formed on the buffer layer, wherein the concentration of the carriers of the first conductivity type of the buffer layer is lower than that of the first conductivity type of the semiconductor of the first conductivity type" is not novel since it is disclosed in document 1 (JP 54-57969) A (Sony Corp.), 10 May, 1979 (10.05.79), figure 11).

Consequently, since the constitution, "a junction field-effect transistor comprising a semiconductor layer of a first conductivity type having a channel region, a buffer layer formed on the channel region, and an impurity region of a second conductivity type formed on the buffer layer, wherein the concentration of the carriers of the first conductivity type of the buffer layer is lower than that of the first conductivity type of the semiconductor of the first conductivity type" makes no contribution over the prior art, the common matter is not a special technical feature within the meaning of PCT Rule 13.2, second sentence.

Therefore, claims 1-9 obviously do not comply with the requirement of unity.

Further, the international search has revealed that the matter common to claims 4-6 which is an aggregation of the matter common to claims 1-9 and "a semiconductor layer of the second conductivity type formed under the channel region" is not novel since it is disclosed also in document 1.

Therefore, this international application contains five inventions: the invention claims [1, 7-9] the invention of claim [2]; the invention of claim [3]; the inventions of claims [4]; and the invention of claims [5, 6].